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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/582,641

06/12/2006

Devis Iellici

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49443 7590 06/27/2008
Pearl Cohen Zedek Latzer, LLP
1500 Broadway
12th Floor
New York, NY 10036

EXAMINER

DUONG, DIEU HIEN

ART UNIT

PAPER NUMBER

2821

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DELIVERY MODE

06/27/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/582,641	Applicant(s) IELLICI ET AL.	
	Examiner DIEU HIEN T. DUONG	Art Unit 2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 June 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>05/28/2008;06/12/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of Application

1. This Office Action is a response to Applicants' Preliminary Amendment filed on 06/12/2006. In virtue of this Preliminary Amendment, claim 30 is canceled; claims 1-29 are currently presented in the instant application.

Priority

2. Acknowledgement is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Information Disclosure Statement

3. The information disclosure statements (IDS) submitted on 06/12/2006 and 05/28/2008 in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is considered by the examiner.

If applicant is aware of any prior art or any other co-pending application not already of record, he/she is reminded of his/her duty under 37 CFR 1.97 to disclose the same.

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "plurality of dielectric pellets" (in claim 20) and "at least one ground plane is sandwiched between the upper and lower surfaces of the dielectric" (claim 24) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claims 1-29 are objected to because of the following informalities:

Claim 1, line 4, "the ground plane" is should be changed to - -the at least one ground plane- - ;

Claim 2, line 2, "the ground plane" is should be changed to - -the at least one ground plane- - ;

Claims 2-29, line 1, "an antenna structure" should be changed to - -the antenna structure- -;

Claim 9, lines 4, "surface" should be hanged to - -said surface of the dielectric pellet- -;

Claim 28, line 3, "less than that" should be changed to - -less than to dielectric constant- -;

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 15-16, 20 and 28-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 15, the term "low capacitance feed" in claim 15, line 4 is a relative term which renders the claim indefinite. The term "low" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Regarding claim 16, the term "high capacitance feed" in claim 16, line 4 is a relative term which renders the claim indefinite. The term "high" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Regarding claim 20, the recitation “an antenna structure as claimed in claim 1 comprising a plurality of dielectric pellets” is unclear. It is unclear since the recitation does not have any support from the specification.

Regarding claim 29, the recitation “the **solid dielectric constant filler** has a **dielectric constant** not **more than** 10% of that of the **dielectric pellet**” in line 2, is unclear. It is not clear that the **dielectric constant of the solid dielectric filler** is more **than** or **less than** the **dielectric constant of the dielectric pellet** since claim 28, line 3-4 defines “a **solid dielectric filler** with a **dielectric constant less than** that of the **dielectric pellet**”.

Clarifications are required.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-16 and 20-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morrow et al. (US 7,102,573 B2), hereinafter “Morrow” in view of Ohtsuka et al. (US 5,801,660), hereinafter “Ohtsuka”.

Regarding claim 1, Morrow discloses, in Figures 2-4, an antenna structure comprising a dielectric pellet (212) and a ground plane (202), wherein the dielectric pellet (212) is elevated above **the ground plane (202)** such that the dielectric pellet (212) does not directly contact the ground plane (202), the dielectric pellet (212) comprising an electrically-conductive direct feed structure (210), and wherein the antenna structure additionally comprises a radiating antenna component (204) which is elevated above the upper surface (302) of the **ground plane (202)** and has a surface that faces a surface of the dielectric pellet (212).

Morrow does not disclose the ground plane including a dielectric substrate with upper and lower surface.

Ohtsuka discloses, in Figure 2, the ground plane (11) being located on the lower surface of a dielectric substrate (2, 9).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the ground plane of Morrow with the ground plane as taught Ohtsuka to achieve claimed invention, doing so would reduce the dielectric loss and lower the manufactured cost (see col. 2, lines 2-10).

Regarding claim 2, as applied to claim 1, Morrow/Ohtsuka disclose, (Morrow, Figures 2-4), wherein the electrically-conductive direct feed structure (210) **extends from the upper surface of the dielectric substrate** and directly contacts the dielectric pellet (212).

Regarding claim 3, as applied to claim 2, Morrow/Ohtsuka disclose, (Morrow, Figures 2-4), wherein the electrically-conductive direct feed structure (202) physically supports the dielectric pellet (212).

Regarding claim 4, as applied to claim 2, Morrow/Ohtsuka disclose, (Morrow, Figures 2-4), wherein the dielectric pellet (212) is physically supported or elevated above the at least one ground plane (202).

Regarding claim 5, as applied to claim 1, Morrow/Ohtsuka disclose, (Morrow, Figures 2-4), wherein the electrically-conductive direct feed structure (210) is selected from a group consisting of a conducting leg, a spring-loaded pin, a metal strip or a metal ribbon.

Regarding claim 6, as applied to claim 1, Morrow/Ohtsuka disclose, (Morrow, Figures 2-4), wherein the electrically-conductive direct feed structure (210) is directly attached to at least one side or surface of the dielectric pellet (212).

Regarding claim 7, as applied to claim 6, Morrow/Ohtsuka disclose, (Morrow, Figures 2-4), wherein the electrically-conductive direct feed structure (210) is directly attached to more than one side or surface of the dielectric pellet (212).

Regarding claim 8, as applied to claim 7, Morrow/Ohtsuka disclose, (Morrow, Figures 2-4), wherein the dielectric pellet (212) is contained in an electrically-conductive **plate**, and wherein the electrically-conductive direct feed structure (210) is electrically connected to the electrically-conductive **plate**.

Morrow and Ohtsuka do not disclose the electrically-conductive plate being a cup or cage. However such difference is not of patentable merits since it would have been

obvious to one having ordinary skill in the art at the time the invention was made to select the electrically-conductive plate being a cup or cage such modification would have involved a mere change in the shape of the conductive plate. A change in the shape is generally recognized as being within level skill in the art.

Regarding claim 9, as applied to claim 1, Morrow/Ohtsuka disclose, (Morrow, Figures 2-4), wherein at least one side or surface of the dielectric pellet (212) is metallised, and wherein the electrically-conductive direct feed structure (210) is soldered or otherwise electrically connected to the metallised side or the surface of the dielectric pellet (212).

Regarding claim 10, as applied to claim 1, Morrow/Ohtsuka disclose, (Morrow, Figure 2-4), wherein the electrically-conductive direct feed structure (210) extending upwardly from the upper surface of the dielectric substrate, wherein the dielectric pellet (212) has a metallised underside that faces the upper surface of the dielectric substrate, and wherein a tip of feed structure (210) electrically contacts the metallised underside.

Morrow and Ohtsuka do not disclose the direct feed being a **spring-loaded pin**.

However, such difference is not patentable merits since it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the direct feed being a **spring-loaded pin** and such modification would have involved a mere change in the type of the feed structure. A change in type of feed structure is generally recognized as being level skill in the art of antenna (see US 2003/0146878 for feed structure being spring type).

Regarding claim 11, as applied to claim 1, Morrow/Ohtsuka disclose, (Morrow, Figure 2-4), wherein the radiating antenna component (204) is an electrically-conductive antenna component.

Regarding claim 12, as applied to claim 11, Morrow/Ohtsuka disclose, (Morrow, Figure 2-4), wherein the radiating antenna component (204) is selected from a group consisting of **patch antenna** (204), slot antenna, monopole antenna, dipole antenna, planar inverted-L antenna and planar inverted-F antenna.

Regarding claim 13, as applied to claim 1, Morrow/Ohtsuka disclose, (Morrow, Figure 2-4), wherein the radiating antenna component (204) is a dielectrically loaded antenna component.

Regarding claim 14, as applied to claim 13, Morrow/Ohtsuka disclose, (Morrow, Figure 2-4 and col. 2, lines 34-42), wherein the radiating antenna component (204) is configured as a planar inverted-L antenna with a radiating structure extending over a block of dielectric material.

Morrow and Ohtsuka do not disclose a **dielectric ceramic material**.

However, such difference is not patentable merits since it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the dielectric material being ceramic material and since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claims 15-16, as best understood, as applied to claim 11, Morrow/Ohtsuka disclose, (Morrow, Figure 2-4), wherein the radiating antenna component (204) is a planar inverted-L antenna having a radiating surface (204) and a shorting pin (206) connected to the ground plane (202), and wherein the dielectric pellet (212) is disposed remote from the shorting pin (206) so as to provide a capacitance feed.

Morrow and Ohtsuka do not disclose the capacitance feed being low or high.

However, such difference is not of patentable merits since it would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the distance between the dielectric pellet and the shorting pin to obtain a desired capacitance feed to optimum the radiation characteristics of the antenna.

Regarding claim 20, as best understood, Morrow/Ohtsuka disclose comprising a plurality of dielectric pellets.

Regarding claims 21-26, as applied to claim 1, Morrow/Ohtsuka disclose, (Ohtsuka, Figure 2),

wherein the ground plane (11) is located on the lower surface of the dielectric substrate (2, 9) (claim 21);

wherein the ground plane (10) is located on the upper surface of the dielectric substrate (2, 9) (claim 22);

wherein a first ground plane (10) is located on the upper surface of the dielectric substrate (2, 9) and a second ground plane (11) is located on the lower surface of the dielectric substrate (2, 9) (claim 23);

wherein at least one ground plane (10) is sandwiched between the upper and lower surfaces of the dielectric substrate (1, 2, 9) (claim 24);

(Morrow, Figures 2-4)

wherein the ground plane (202) **extends across** at least that part of the dielectric substrate that is located directly below the elevated dielectric pellet (claim 25);

wherein the ground plane **extends across substantially** an entire area of the dielectric substrate (claim 26).

Regarding claim 27, Morrow/Ohtsuka disclose every feature of claimed invention as expressly recited in claim 1, except for the ground plane being **absent** from an area of the dielectric substrate that is located below the dielectric pellet.

However, such difference is not of patentable merits since it would have been obvious to one having ordinary skill in the art at the time the invention was made to extend the ground plane on the dielectric substrate to achieve the desired antenna radiation characteristics and such modification would have been deemed obvious to person skill in the art.

Regarding claims 28-29, as best understood, as applied to claim 1, Morrow/Ohtsuka disclose, (Morrow, Figures 2-4, and col. 2, lines 34-42), wherein a gap defined between the dielectric pellet (212) and the upper surface of the dielectric substrate is filled with a solid dielectric filler with a dielectric constant more than dielectric constant of the dielectric pellet.

Morrow and Ohtsuka do not disclose wherein the solid dielectric filler having a dielectric constant not more than 10% of that of the dielectric pellet.

However, such difference is not of patentable merits since it would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the dielectric constant of the solid dielectric filler and dielectric pellet to optimum the radiation characteristics of the antenna. Therefore, to employ having the solid dielectric filler having a dielectric constant not more than 10% of that of the dielectric pellet would have been obvious to person skill in the art.

10. Claims 17-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morrow et al. (US 7,102,573 B2), hereinafter "Morrow" in view of Ohtsuka et al. (US 5,801,660), hereinafter "Ohtsuka" and further in view of Mikkola et al. (US 2003/0146878 A1), hereinafter "Mikkola".

Regarding claims 17-19, Morrow and Ohtsuka disclose every feature of claimed invention except for the radiating antenna component is provided with an independent feed; wherein the radiating antenna component is a planar inverted-F antenna; further comprising at least one additional radiating antenna component having a surface that faces a surface of the dielectric pellet.

Mikkola discloses, in Figure 1, the radiating antenna component is provided with an independent feed; wherein the radiating antenna component is a planar inverted-F antenna; further comprising at least one additional radiating antenna component having a surface that faces a surface of the dielectric pellet.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the radiating antenna component of Morrow and Ohtsuka

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with the radiating antenna component as taught by Mikkola, doing so would provide a simple and inexpensive antenna device (see page 1, par. [0008]).

Citation of Relevant Prior Art

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Chen (US 6,795,023 B2) discloses feed structures integrated with a suspended antenna to increase bandwidth of the antenna.

Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DIEU HIEN T. DUONG whose telephone number is (571)272-8980. The examiner can normally be reached on Monday - Friday, from 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W. Owens can be reached on 571-272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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/Trinh Vo Dinh/

Primary Examiner, Art Unit 2821